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# DEVELOPING A DIGITAL CULTURE AND EMBEDDING DIGITAL AGILITY WITHIN A LIBRARY WORKFORCE

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## Abstract

“Culture is the most significant self-reported barrier to digital effectiveness” (Goran, LaBerge & Srinivasan, 2017). Universities are looking to a “different kind of education for a much more uncertain world” (Havergal, 2017). University Libraries are preparing students to be effective citizens in these changing times by ensuring graduates are information and digitally literate.

To continue to evolve and provide excellent library services it is essential that the library workforce embraces the challenges that the Fourth Industrial Revolution poses. Following the successful development and launch of an Information and Digital Literacy (IDL) framework for learning and teaching, The University of Sheffield (TUoS) Library is exploring how it can be adapted to provide a workforce development tool kit.

This paper will explore whether it is possible to adapt the IDL framework into a staff development tool that supports the embedding of a digital culture at the University of Sheffield Library. Can this framework be used to enhance the digital readiness of staff and can it support diversity and talent management?

There has already been some engagement with staff through the Library’s ‘Let’s do digital’ campaign and Library Carpentry workshops. A strategic focus has been to attract and grow talent and to strengthen innovative teams and their digital competencies. As yet, there has not been a systematic approach to assessing where our staff are in their digital development and where there might be gaps in workforce skills and the Library’s overall capacity to deliver.

**Keywords: digital skills, staff development, library workforce, information and digital literacy**

## Introduction

### Background

The University of Sheffield (TUoS) is a research led, world top 100, Russell Group University in the UK. The University Library operates from five sites, including our award winning Information Commons and The Diamond. The Library employs 180 staff and is committed to workforce development, as a strategic priority for ‘our library of the future’ including the ongoing development of digital skills and nurturing a culture that supports digital aspirations. The Library’s Strategic Plan, “Our Library. Our Information Future”, presents a future that will only be realised if our workforce has a higher level of technical knowledge, sophistication and technical application to advance the Library’s aspirations and the University’s mission.

Transitioning to new models of scholarly communication and open access publishing, influencing and shaping research data management policy and practice, implementing technologies that allow discovery on a global scale and maximising human to computer interactions as we continually embed new technologies are just some of the strategic aims.

Information professionals working in academic libraries are acquiring more and more digital skills necessary for them to be successful in their job roles. Much of this is happening through institutional and professional training programmes and workshops, with workplaces recognising the need to encourage and support 'continuous individual learning' (IFLA, 2016) for this new wave of technological change. Targeting specific technologies and tasks is usual, with organisations growing their competencies in a largely organic way.

And yet, libraries are far more programmatic and collaborative in developing the literacies students need to be at the cutting edge of their discipline and influential digital citizens when they graduate. At TUoS, the Library's new [IDL Framework](#) was endorsed by the University's Learning and Teaching Committee in November 2017. This was the culmination of a year-long, highly collaborative project with the University's Directors of Digital Learning, student associates for learning and teaching, the TEL (Technology Enhanced Learning) team, academic teachers and national leaders in these fields. Resources have been developed. Workshops, webinars and tutorials have been mapped to the six literacies. Partnerships with academic programmes continue to be formed. The investment has been significant.

Some universities are talking about extending the curriculum to make students ready for the AI revolution, suggesting we need a "different kind of education for a much more uncertain world of work" (Spence, 2017). Sir Keith Burnett, the Vice-Chancellor of the University of Sheffield is quoted as saying "Universities will be caught up in 'Olympian' levels of competition in coming years as countries race to make advancements in fields such as artificial intelligence and robotics" (Pells, 2018).

As we invest more and more in preparing our students for unbelievable technological change, a reasonable question to follow is how are we preparing our staff?

More specifically, the question for TUoS Library has become whether the same conceptual IDL framework designed for our students is able to be extended to our staff? How would this translate in practice? What adaptations might be needed?

### **Libraries in a digital space**

Digital transformation is not new to academic libraries and it takes only a cursory look at our history to see the remarkable technological changes that have occurred in library services and operations over the past four decades. For libraries, the global infrastructure revolution started with the introduction of computers into libraries the 1980s and the first generation library systems. The revolution continued to gain momentum throughout the 1990s increasing at pace up until the current day. This has been fuelled by the the continuing rise in network connectivity and increases in bandwidth/speed, and the revolutionary impact of the World Wide Web.

Re-visiting Griffin's account (Griffin, 1998) of the Digital Libraries Initiative (NSF/DARPA/NASA) is a reminder that along with knowledge and expertise in their own domains, these early pioneers possessed the personal attributes we'll need today to take on the big challenges as we face a new industrial revolution. These attributes include the ability to stretch thinking and stimulate interactions that cross disciplines and organisational

boundaries; the confidence to take risks and apply different methodological approaches to solve problems, and the openness to try and learn new things when the future consequences of actions cannot always be known. The 1990s were seen as a critical decade. And while remarkable advances have been made, most 5-year library strategic plans since that time have as a constant theme the need to transform workforces for the digital age.

The Library's services are now more integrated into the day-to-day activities of our students, academic teachers and researchers. Our communities are able to access through standard browsers the resources libraries have acquired, developed and curated. The public are increasingly able to read our institutions' research publications and accompanying data. Open access policies and strategies are having an impact on the traditional publishing business models. This seems 'seamless', a word that has fallen out of favour with some as it suggests a simplicity which is not authentic. Library workforces are under pressure. The time when a talented group of specialists was sufficient to conceptualise, develop and deliver new services to more technologically savvy audiences has passed. Technical knowledge and skills that were once seen as the domain of experts are being incorporated into library job roles across the organisation, reaching into every department.

And the pace of technological change is relentless. Schwab (2017), in *The Fourth Industrial Revolution*, refers to 2025 as a tipping point, when we will see the first implantable mobile phone, a supercomputer in your pocket, and over 1 trillion intelligent sensors connecting every physical product. While Brynholfson and McAfee (2014), in describing innovations of the past few years, reflect that 'progress was frustratingly slow for a long time . . . But then digital progress became sudden... [and] this happened in multiple areas, from artificial intelligence to self-driving cars to robotics'. The popular press (Harris, 2018; McGoogan, 2017) often links the 'rise of robots' to the loss of jobs and there are studies that support this prediction (Ford, 2015; Frey, Osborne & Holmes, 2016). Consistent across all the commentary is that we've only seen a small indication of what's to come.

Library leaders are paying attention to these 'technological megatrends' as described by Schwab (2017) and are aware that to be successful in advancing the aspirations of our institutions, our academic colleagues and the communities we serve, it will be critical to shift the library's digital strategies to a higher gear. Brynholfson (2014) talks about 'learning to race *with* machines' and learning what machines can and can't do. Working with new technologies provides new opportunities for our students and staff to be innovative and creative, and form new ideas and concepts. Universities see these as essential attributes for our graduates and library job roles increasingly incorporate these qualities in the person specification for many, if not all, positions.

## Culture of digital aspirations

Libraries are in the service business and understand the value of a customer-centric organisation and culture. In practice, though, how well placed are we for the challenges ahead? It is suggested by Goran, LaBerge and Srinivasan (2017) that “Culture is the most significant self-reported barrier to digital effectiveness.” A culture of ‘digital aspirations’, embracing ‘nimble resources allocation’ and using new tools and data to understand and get close to your customers are proposed as key elements of this culture for success. The pillars for change below, modified from Goran et al, align well with the TUoS Library’s commitment to “creating environments that nurture talent, empower staff to learn from each other, allow innovation and the translation of ideas into benefits for students, staff and researchers.”(TUoS, 2016). It will be important to reflect upon our vision and how we see *our library of the future* when developing and critiquing the six digital literacies we require of our staff.

### A Culture for a Digital Age

#### 1. Customers, Customers, Customers

*Getting to know customer needs, their expectations of service response, and customer behaviours in order to build closer relationships.*

#### 2. Data and tools

*Connecting the right data to the right decisions with the right set of tools to build a common understanding of the customer.*

#### 3. Busting silos

*Sharing information or collaborating across functions to bust siloed thinking and share accountability.*

#### 4. Appetite for risk, learning and trying things

*Developing the skills, mind-sets and access to information staff need to be empowered to take calculated risks.*

#### 5. Embracing digital aspirations

*Making bold bets backed up by nimble resource allocation, and letting go of some decisions and some functions.*

*Modified from Goran, LaBerge and Srinivasan (2017)*

## Our research questions:

1. If skills audits have not prompted the change then what approach should we take?
2. Given that we are training students to be responsible digital citizens how should we support staff in the same endeavour?

## Why not skills audit?

By its very nature the term ‘audit’ suggests that there is something missing and a result of an inspection or required correction. This language is intimidating and therefore is unlikely to encourage staff to engage. Our approach is to look at the competencies, attitudes and characteristics required and broadening these to embrace the digital environment with confidence and assertion; it is intrinsic and will enable staff to build on their inner capabilities. Digital skills are integral to work of libraries. It is not necessary to know all things digital, but to have a platform from which to ‘unpack the box’ and be able to explore new ways of working and new tools for effectiveness.

## Why not a Training Need Analysis(TNA)?

“The ability for organisations to successfully evolve is ultimately determined by the capability of their staff. Transformation of the organisation is inextricably linked to the transformation of individuals and for that to be a reality, learning has to be at the core” (Daly & Overton, 2017).

The digital revolution means that digital skills are not about improving performance but are fundamental to all modern jobs and lead to the transformation of individuals.

TNA tends to be used to identify the gaps between staff training and determines the objectives of the training; it suggests a linear relationship. TNA is the first stage in the training process and involves a procedure to determine whether training will indeed address the problem which has been identified. The challenges of the digital age are far greater than can be addressed through TNA. It is clear that the attributes and aptitudes needed to meet the delivery demands of the TUoS Library Strategic Plan are much more holistic and do not follow straight line logic; they are often chaotic and distributed. Our aim is to engage and support staff through the application of a framework to analyse their own information and digital skills and be self-directed and motivated to grow.

### **Digital literacy for all staff and digital specialisms for some**

“The skill set needed by academic librarians in contemporary digital learning environments...continues to expand, demanding a breadth and depth of knowledge beyond the requirements assumed in the early days of hybrid libraries” (Corrall, 2011). Today, digital skills are integral to our lives in many facets, though often the ways we have learned to work with technologies in our personal lives are not pulled across into the professional setting. Beetham (2015) in identifying key issues in framing the digital capabilities of staff refers to organisations needing both ‘general digital capability or facility (ease with familiar devices, services and applications) and digital specialisms’.

For organisations, developing and continually refreshing the general digital capabilities of staff will be the greater catalyst for change. At TUoS Library we have been broadening our training programme over the last few years to include a variety of activities to extend the digital fluency of our workforce. The initial focus is therefore to pilot a framework to address these general digital capabilities. Following a successful pilot, it is envisaged that the attributes and depth of knowledge required for digital specialisms at intermediate and expert level would be developed. Roles supporting repositories, research data management, creation of learning resources, digitisation and data visualisation are just some examples where libraries are requiring expertise at different levels. The potential benefits of an IDL Framework for staff extend beyond training to guiding recruitment and career advancement.

### **The 6 Information and Digital Literacies (IDL) for staff**

IDL is one of the core Sheffield Graduate Attributes; ‘it blends information literacies with digital capabilities transcending technological skills and tools to identify with learning, living and working in a fluid digital world.’ Building on the work of Grant et al (2017) our focus on literacies in our strategy and framework has left opportunity for specific digital tools and skills to be considered and introduced at an operational level.

The table below analyses the application of the framework for our staff and examines the core digital capabilities that we would expect to see.

IDL framework	Application for Library Staff
<b>Discovering</b> is the literacy which enables learners to develop search strategies and utilise a broad range of generic and discipline specific resource discovery tools. Information discovery might be guided, inquiry based, or serendipitous.	<b>Discovery</b> is the literacy that enables staff to draw on higher education (HE) and library-specific literature to keep up to date with developments in the information landscape. Staff are able to research new approaches to providing services and support to students and academics, and make connections across boundaries.
<b>Understanding</b> is the literacy which enables learners to find meaning and apply context. It encompasses academic reading from a broad range of media, both textual and visual, and intersects closely with critical literacy.	<b>Understanding</b> is the literacy that enables staff to stand back and take a wider view of their work and critique systems and processes using a range of digital tools; engage with peers and stakeholders in open discourse and take account of many views before reaching a conclusion. Staff look at the wider HE landscape and see how they support the academic and student communities.
<b>Questioning</b> is the literacy which enables learners to analyse, evaluate, interpret and think critically about information. Questioning, sometimes referred to as critical literacy, sits closely with the literacy of understanding	<b>Questioning</b> is the literacy that enables staff to ask questions about changes needed to services and systems. Staff are able to reflect and critically review data and information to form clear options; recognising bias in others opinions.
<b>Referencing</b> is the literacy which enables learners to acknowledge the work of others, building on their own analysis of existing knowledge. It also enables learners to attribute sources by creating citations and generating accurate bibliographies. These skills sit within a broad understanding of the legal and ethical context of information and help learners to manage their information and avoid plagiarism	<b>Attributing</b> is the literacy that enables staff to respect the ownership of the work of others, with a clear and sound awareness of the legal and ethical context of information within the digital context that we work in. Staff are able to challenge the inappropriate use of other's materials.
<b>Creating</b> is the literacy which enables learners to blend ideas and produce new knowledge. Knowledge is created through a range of sources and embraces textual, visual and auditory approaches.	<b>Creating</b> is the literacy that enables staff to collaborate, blend ideas and produce new knowledge. Staff are able to synthesise and appraise the merits of different and sometimes opposing views to find solutions and exploit opportunities.
<b>Communicating</b> is the literacy which enables learners to succinctly summarise and share their work and ideas. It has a dynamic relationship with knowledge creation but focuses on the dissemination, rather than creation, of ideas. Communicating effectively creates a strong and influential public identity. Digital curation is an important element of this.	<b>Communicating</b> is the literacy that enables staff to speak up with ideas, and establish themselves as clear thinkers who are able to convey information in many forms including visual, auditory and digital. Staff are able to generate impact and participate in professional networks within and beyond their discipline.

Fig 1 - application of IDL Framework to staff core digital capabilities

## **Next steps**

Libraries are very familiar with the concept of IDL as a graduate attribute that we expect of our students. Throughout the development of the IDL Framework for students, there has been a shared understanding among stakeholders that individuals are not the best placed to assess their own digital skills and capabilities (Kruger & Dunning, 1999). This is also guiding the development of a framework for staff and has become more evident in the 'Let's do Digital' activities we have been offering. The Library is adopting a consistent approach across all audiences; and that is looking to the literacies we need for learning and for the workplace. A strategic commitment to creating the right environment and strengthening the Library's digital culture is seen as critical to enabling transformational change across the organisation. Creating safe spaces and developing the resilience of learners are key elements of this that we are already adopting.

### Creating the right environment in the Library

We have seen part of the elements of the new culture emerge from the other strategic projects that have been undertaken at TUoS Library; for example, developing service delivery models to reach all students in all spaces physical and digital. A core project planned for 2019 will bring together these elements and look at how to embed them as well as provide strong steers to support the future success of library services.

van Reenan (2001) argues that "rather than stifling chaos, managers should allow it to flourish" and "ensure that the environment encourages interaction and creativity". He goes on further to suggest that "digital library leaders...give up control to achieve innovation....develop resilient employees that can absorb future shocks....ensure effective decision making and encourage risk taking." Dean (2015) explores followership styles, passive, active and proactive, and their implications for library leaders "when leaders do not reward partners for taking risks, or provide incentives for passive staff to experiment, staff may find it easier to stay within the confines of the work they already know". This stifles innovation and stops the leaps that are needed to take the Library workforce forward.

Embracing digital aspirations will mean letting go of some of the things that we do now and the way we do them. A strategic priority under our current library plan has been re-imagining how we support student enquiries. New services have been introduced and this creative thinking is encouraged. Sustaining dynamic change is a key challenge. Moving to a more matrix-managed staffing model that enables nimble direction of resources to priorities will be critical. The Library recognises that pursuing new ventures and service development, making some bold bets and resourcing these are all part of our current environment. This requires confident leadership throughout the organisation at every level.

### Reviewing how our current training offer supports staff

'Let's Do Digital' has been developed in the TUoS Library as a training programme for staff. It has focused on developing digital fluency for staff, specifically confidence in using emerging technologies and the digital tools that our students are using. The initiative introduces staff to a range of digital tools available to assist them in their day to day work and practice. The Library provides the opportunity - the time and the space – for staff to experiment and build their confidence so that they are able to try new applications on different devices and think about how they may be implemented.

It has been somewhat random and chaotic in its initial phases based on digital tools and their attributes. This has included testing the understanding of the landscape of apps that



support task completion, building familiarity with different devices and breaking down some of the myths about 'what happens if I get this wrong'! From this initial work it has become apparent that a more holistic and deeper approach is needed so that staff fully absorb the requirements, opportunities and challenges of the digital workplace.

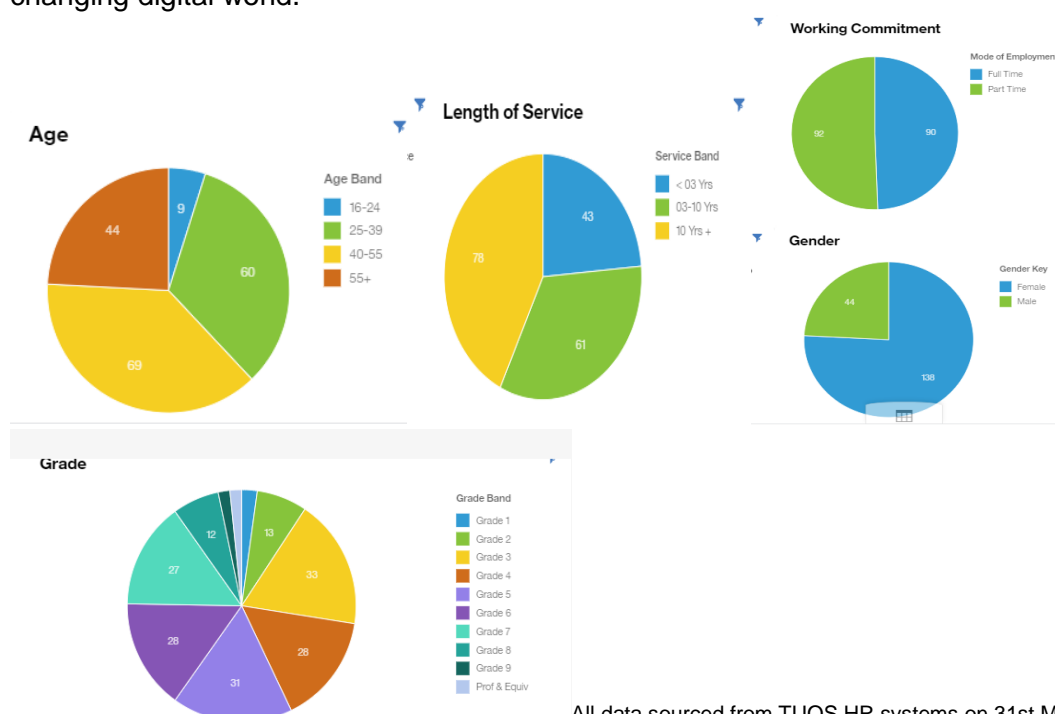
At the other end of the spectrum, Library Carpentry has provided several specialist and digitally astute members of the workforce with new methods of working; its penetration has not reached the wider workforce. It is helping to break down barriers for staff who want to know more about coding and manipulating data. These workshops have been positively received but still appeal mainly to those who are already digitally confident. The wider library workforce needs to develop stronger foundations to enable it to embrace the opportunities and innovations that the new digital age presents.

### Working with the Library workforce demographics

The charts below show some key challenges that TUOS Library is considering when implementing a programme of digital skills improvement. First is the age profile: nearly 2/3rds of the workforce are over 40. And less than 10% are under 25. This is not unusual amongst library and information skills professionals, but it does pose challenges for establishing a core set of digital skills as requirement for all staff. A significant proportion of the workforce will not have firm foundations upon which to draw and will not feel confident in expanding their skills.

The part-time working patterns pose challenges for ensuring staff can be released for sufficient time to upskill and experiment in the digital space. Scheduling training needs to take into account not only the usual operational and logistical issues, but also differences in appetites for learning. There is evidence that the grade demographic is also changing; in the past we would have expected a more pyramid shaped profile but we are now seeing more bunching across the mid-level grades as more work is specialised. This is likely to increase.

In the past libraries focussed upon recruiting new talent to address the digital challenges we faced. Given the scope of the change ahead of us it is important that all of our workforce has the core digital capabilities needed to embrace new career aspirations in a rapidly changing digital world.



All data sourced from TUOS HR systems on 31st March 2018

## Conclusion

"Emerging operating models also mean that talent and culture have to be rethought in light of new skill requirements and the need to attract and retain the right sort of human capital. As data becomes central to both decision-making and operating models across industries, workforces require new skills, while processes need to be upgraded...and cultures need to evolve." (Schwab, 2017). Adapting and applying the IDL framework for staff, and looking to the literacies we need, has the potential to support the change in culture required to meet the digital aspirations of the Library.

There will be challenges along the way; changes of culture do not always suit all staff. Some will be quick to adapt and learn; others will need to be shown how they fit in. For all staff there will be a shift in career aspirations as some of the skills and experience that might have been previously valued will be replaced with different job roles and capabilities that some may not have.

The culture change required now means that all staff must reflect on the contribution they can make, review their career paths and aspirations, possibly alter direction and gain new skills. This is a highly disruptive time and requires supportive and stretching leadership styles, not just at the top of the organisation. The traditional hierarchal structure is probably passed its use-by date. Many of the challenges we face are not unique to a digital culture, they are facets of all change programmes. What sets the digital skills challenge apart is its ability to impact the very DNA of the expectations the workforce has of itself.

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The University  
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# Information and Digital Literacy Framework: For education, employment and citizenship.

shef.ac.uk/library/idl\_framework

Information and digital literacy (IDL) enables engaged learning. It blends information literacies with digital capabilities transcending technological skills and tools to identify with learning, living and working in a fluid digital world. IDL enables learners to discover and absorb information in a critically engaged manner, innovate in active pursuits of creative scholarship, demonstrate integrity by acknowledging the work of others and make a contribution for others to share.

Information and digitally literate students are appreciative and discerning and are able to locate, evaluate and interrogate texts in a critical manner. They can produce, share, use and remix digital information within an ethical context. Intrinsic to this is the ability to understand and apply copyright regulations. IDL embraces a range of media, and engages with societal shifts towards a highly collaborative and hyper-visualised world. Information and digitally literate students are responsible and empowered citizens who develop positive and influential digital identities.

## Discovering.

Discovering is the literacy which enables learners to develop search strategies and utilise a broad range of generic and discipline specific resource discovery tools. Information discovery might be guided, inquiry based, or serendipitous.

## Understanding.

Understanding is the literacy which enables learners to find meaning and apply context. It encompasses academic reading from a broad range of media, both textual and visual, and intersects closely with critical literacy.

## Questioning.

Questioning is the literacy which enables learners to analyse, evaluate, interpret and think critically about information. Questioning, sometimes referred to as critical literacy, sits closely with the literacy of understanding.

## Referencing.

Referencing is the literacy which enables learners to acknowledge the work of others, building on their own analysis of existing knowledge. It also enables learners to attribute sources by creating citations and generating accurate bibliographies. These skills sit within a broad understanding of the legal and ethical context of information and help learners to manage their information and avoid plagiarism.

## Creating.

Creating is the literacy which enables learners to blend ideas and produce new knowledge. Knowledge is created through a range of sources and embraces textual, visual and auditory approaches.

## Communicating.

Communicating is the literacy which enables learners to succinctly summarise and share their work and ideas. It has a dynamic relationship with knowledge creation but focuses on the dissemination, rather than creation, of ideas. Communicating effectively creates a strong and influential public identity. Digital curation is an important element of this.

## Novice

### Discovering.

Connects with information through guided reading and serendipitous resource discovery.

### Understanding.

Captures understanding from a range of sources using basic recording techniques. Contributes to peer discussions.

### Questioning.

Recognises different types of information. Is aware of the peer review process. Can formulate a question and interpret questions posed by others.

### Referencing.

Respects ownership of the work of others. Can quote, summarise and paraphrase. Generates citations and bibliographies.

### Creating.

Is familiar with a range of digital creation tools and is aware of, and follows the conventions required within their discipline. Presents ideas within the context of these conventions.

### Communicating.

Knows how to share information and disseminate knowledge, and takes responsibility for sharing information appropriately. Demonstrates respect for other points of view. Creates a digital identity.

The IDL framework presented here communicates the six broad literacies supported at the University of Sheffield, namely: discovering, understanding, questioning, referencing, creating and communicating. These literacies interconnect and develop throughout the curriculum, taking learners from novice to expert, supporting student transitions and underpinning a transformational learning experience. IDL is shaped by the context. It recognises and transcends conventions to enhance inter-disciplinary.

Familiarity with a range of digital devices, and confidence in seeking out and applying guidance, when required, underpins IDL. Information and digital literacy is one of the core Sheffield Graduate Attributes. The University is committed to ensuring that all our students have the support to develop information and digital literacy to enable a research-led university experience. This will position them well for graduate level employment and will equip them with life skills which are transferable to the demands of an increasingly complex digital world.

## Intermediate

### Discovering.

Recognises the value of information from a broad range of sources. Searches beyond the reading list using natural language techniques. Applies guided filters and is selective in the amount and quality of information found. Moves beyond familiar social networks to discover a broader range of views.

### Understanding.

Develops recording techniques by selecting appropriate software such as mind mapping tools. Actively engages in peer discussions.

### Questioning.

Asks questions about context, authorship and intent, within the parameters of the discipline. Is aware of potential sources of bias, especially in new or unfamiliar sources. Is reflective. Utilises evaluation tools. Is able to identify and critique citation data. Can interpret the almetrics associated with scholarly outputs.

### Referencing.

Recognises the difference between original work and existing knowledge. Understands academic referencing in the context of the discipline. Cites and attributes information. Utilises reference management software.

### Creating.

Compares and contrasts different viewpoint and works within the creative process to present new meaning. Can interpret and apply formatting requirements, as set in assessment criteria, for a range of digital creation tools.

### Communicating.

Engages in dialogue and debate. Develops voice and identity. Is persuasive. Utilises a range of digital tools to communicate via different mediums. Understands the power of visual and auditory communication.

## Expert

### Discovering.

Constructs and re-constructs a search strategy using search language taxonomies. Is reflective and iterative and understands and applies a broad range of search filters. Combines search terms using Boolean operators, sets auto-alerts and utilises social media aggregators. Is discerning in the amount and quality of information found. Is mindful of the assumptions contained within resource discovery.

### Understanding.

Develops a dynamic approach to critically and appreciatively understanding information. Utilises digital tools to actively participate in an inclusive learning environment. Facilitates peer discussions.

### Questioning.

Understands that information is constructed and contextual. Respects different disciplines and is appreciative of a broad range of epistemic positions. Can identify potential bias in an author's view, including financial, political, social or individual gain. Is well informed of the attributes of information sources that are considered to be academically credible.

### Referencing.

Cites and attributes information, with consideration of the broader context of an author's work. Uses advanced features of reference management software.

### Creating.

Synthesises and appraises the merits of different and sometimes conflicting viewpoints. Demonstrates self reflection when creating new meaning and challenges conventions. Is confident in the use of a range of digital creation tools including those which allow for the co-production of knowledge. Has a flexible approach to new media and continuously embraces emerging technologies.

### Communicating.

Develops insight of communicating with different audiences, within and outside of academia. Develops an influential digital identity. Builds followers. Generates impact. Participates actively in offline and online networks within and beyond the discipline. Curates knowledge via digital hosting services and labels outputs to enable discovery.

